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United States
Department of
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Soil
Conservation
Service

Montana
Agricultural
Experiment
Station

Bozeman,
Montana

MONTANA WATER SUPPLY OUTLOOK

Snowpack and Streamflow
Forecasts as of
April 1, 1983.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
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BOZEMAN, MONTANA 59715
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Snowpack shows little improvement

The southwest corner of Montana continues to receive good moisture from storms passing to the south. Two good storm systems out of the east created an upslope condition and deposited heavy snow in the Red Lodge area and on the east slope of the Crazy Mountains. Some areas in northwest Montana continue to receive fairly good moisture. The remaining areas of the state continue to show deficit snowpack with central and north central Montana having the poorest snow conditions. The snowpack accumulation period is nearing its peak for the season. Many low elevations have already experienced melt during March.

No significant changes are expected in this season's snowpack unless April snowfall is extremely heavy.



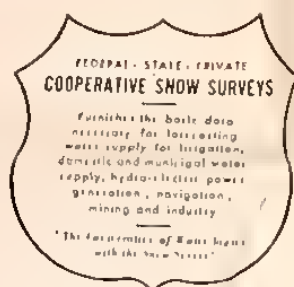
Variable forecasts throughout state

Most drainages in Montana are forecast to produce below average runoff during the spring and summer months. The Milk River system, where diversions from the St. Mary's River make up the major part of the streamflow, and the inflow to Cooney Reservoir near Red Lodge are forecast near average. The southwest corner continues to get good moisture and flows are forecast to be average or above average.

Extremely low runoff is predicted for a large part of central and north central Montana. Although forecasts do not indicate record low flows in this area, they are in the lowest three to five years of record. Most of the low area is in locations that can have large spring rains and some shortages can be eliminated with average or above average spring moisture. However, if present weather patterns continue, shortages will be widespread. Moderate to severe shortages of irrigation water supplies are anticipated for most drainages west of the Divide and in parts of the Yellowstone River system.

The Montana Water Supply Outlook is a publication of the U.S. Soil Conservation Service. The SCS administers the Cooperative Snow Survey Program in cooperation with other federal, state and private agencies, organizations, and individuals.

The report is prepared by SCS, Snow Survey and Water Supply Forecast Staff, P.O. Box 98, Bozeman, Montana.



Snow survey program to be reorganized

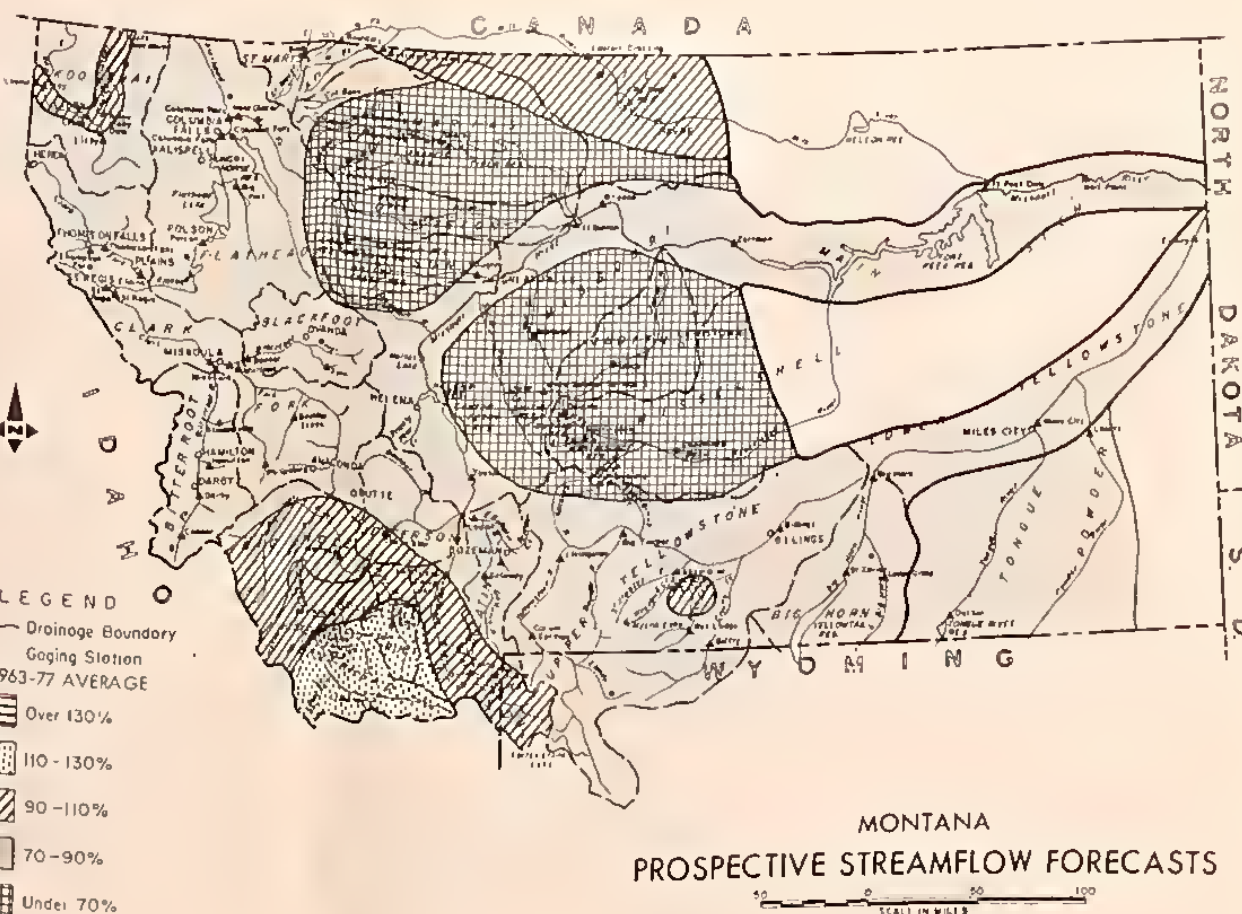
The Soil Conservation Service is reorganizing the Snow Survey and Water Supply Forecast Program to improve service and reduce costs.

The reorganization will impact Montana operations in three major ways. One change will be in the scope of the Bozeman office responsibilities. The reorganization divides data collection and forecasting responsibilities. It also centralizes data collection responsibilities. Montana will now collect snowpack data for Montana and northern Wyoming. The addition of Wyoming will increase Montana SCS responsibility for automated SNOTEL sites from 65 to 108 and for manual courses from 250 to 310.

The second part of the reorganization affecting Montana is the centralization of forecasting responsibilities. A unit in Portland, Oregon will analyze and produce regional and statewide forecasts for the western states after October 1984. Until then, Montana will continue to produce its own water supply outlook.

The reorganization also calls for a reduction in nonessential manually read snow courses by 1986. The first step--slated for 1983-- is to study and evaluate the importance of manual courses to accurate forecasting. The plan is to reduce the number of manual snow courses or readings, or both, to a minimum level compatible with user needs. No important courses will be eliminated unless reliable alternative data is available.

For more information on the reorganization, write to Phil Farnes, SCS Snow Survey Supervisor, P. O. Box 98, Bozeman, MT 59715, or call him at (406) 587-5271 Ext. 4270.



MONTANA
PROSPECTIVE STREAMFLOW FORECASTS

Yellowstone River Drainage

STREAMFLOW FORECASTS

BASIN, STREAM and/or FORECAST POINT	PERIOD	THIS YEAR		1963-77 AVERAGE		THIS YEAR		PAST RECORD	
		FORECAST	THOUSANDS ACRES FEET	FORECAST	THOUSANDS ACRES FEET	FORECAST	PERCENT OF AVERAGE	LAST YEAR	AVERAGE
		April - September		April - July					
YELLOWSTONE RIVER at Corwin Springs	1790	85	2497	2,102	1495	85	1978	1,749	
YELLOWSTONE RIVER near Livingston	2040	83		2,471	1690	83		2,048	
BOULDER RIVER at Big Timber	330	79		416	305	80		382	
STILLWATER near Absarokee (1)	565	86		660	480	86		555	
CLARK'S FORK RIVER near Belfry	520	81		644	465	82		564	
ROCK CREEK near Red Lodge				118	discontinued by USGS			91.4	
INFLOW COONEY RESERVOIR near Boyd (2)	59.0	91		64.5	49.0	93		52.5	
YELLOWSTONE RIVER at Billings	3872	83	5171	4,682	3300	83	4307	3,979	
BIGHORN RIVER near St. Xavier (3)	1566	77	2116	2,034	1430	77	1693	1,861	
LITTLE BIGHORN RIVER near Mardin	157	80	112	196	140	80	96.6	174	
TONGUE RIVER near Decker	216	75		288	197	75		263	
YELLOWSTONE RIVER at Miles City (4)	5642	79		7,142	4940	79		6,243	
POWDER RIVER at Moorhead	185	73		253	170	73		234	
YELLOWSTONE RIVER near Sidney (5)	6111	78		7,806	5310	78		6,805	



- (1) Adjusted for storage in Mystic Lake.
- (2) Adjusted for storage in Cooney Reservoir.
- (3) Adjusted for storage in Buffalo Bill, Boysen, Bull Lake, Pilot Butte and Bighorn Reservoirs.
- (4) Adjusted for storage in Bull Lake, Buffalo Bill, Boysen, Pilot Butte, Bighorn and Tongue River Reservoirs.
- (5) Adjusted for reservoirs shown in (4) and diversions into the Lower Yellowstone Canal.

ALL FORECASTS PREPARED IN COOPERATION WITH THE NATIONAL WEATHER SERVICE

SUMMARY OF SNOW MEASUREMENTS

RIVER BASIN and/or SUBWATERGAGE	Number of Gauging Stations	THIS YEAR'S SNOW WATER AS PERCENT OF 1963-77 AVERAGE
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Upper Yellowstone			
ab Livingston	21	71	78
Shields	8	84	78
Boulder & Stillwater	10	76	76
Rock Creek & Clark's Fork	17	86	84
Yellowstone (ab Bighorn River)	56	78	79
Bighorn/Wyoming	19	74	80
Little Bighorn	3	87	71
Bighorn (Total)	22	76	79
Tongue	9	83	80
Powder	7	85	86
Yellowstone (Total)	94	78	80

WATER SUPPLY OUTLOOK

Expressed as "Poor, Fair, Average, Excellent" With Respect to Usual Supply

STREAMS or AREA	Spring Season	Late Season
Yellowstone at Livingston	Fair	Fair
Shields	Fair	Poor
Rouder	Fair	Fair
Sweetgrass - Big Timber	Fair	Poor
Stillwater	Fair	Fair
Rock Creek	Fair	Fair
Clark's Fork	Fair	Fair
Yellowstone above Bighorn	Fair	Fair
Bighorn	Fair	Fair
Little Bighorn	Fair	Fair
Tongue	Fair	Poor
Powder	Fair	Poor
Lower Yellowstone	Fair	Fair

Snowpack changes little

During the last month, two major upslope storms approached the Yellowstone headwaters from the east and deposited large amounts of snow in the Red Lodge area. Lesser amounts fell on the east side of the Crazy Mountains.

The area around Red Lodge now has a near to above average snowpack. Some snowfall has occurred in other areas but most locations still have only 75 to 85 percent of average snowpack.

Some melt has occurred in lower elevations with most valley areas and south-facing foothills and slopes bare of snow.

Forecasts remain low

Forecasts for spring and summer runoff are generally a little lower than those issued last month except for the Red Lodge Creek Drainage.

Streamflows will be adequate for most early season irrigation but river flows will drop sooner than usual with shortages of irrigation water supplies expected by early July and continuing through the irrigation season. Shortages will be most noticeable on smaller heavily used streams such as the Clark's Fork River and Rock Creek.

Missouri River & Hudson Bay Drainages

STREAMFLOW FORECASTS

BASIN, STREAM and/or FORECAST POINT	PERIOD	THIS YEAR		1963-77 AVERAGE		THIS YEAR		PAST RECORD	
		FORECAST	THOUSANDS ACRES FEET	FORECAST	THOUSANDS ACRES FEET	FORECAST	PERCENT OF AVERAGE	LAST YEAR	AVERAGE
		April - September		April - July					
RED ROCK RIVER near Monida (1)	142	129	150	110	135	131	135	101	
BEAVERHEAD RIVER near Grant (2)	191	112	228	171	165	111	194	148	
BEAVERHEAD RIVER at Barratts (2)	237	105		226	208	106		196	
RUBY RIVER near Alder	117	111		105	100	112		89.0	
BIG HOLE RIVER near Melrose	715	90		792	660	90		730	
ROULDER RIVER near Boulder				103	discontinued			96.7	
WILLOW CREEK near Harrison	24.5	114		21.5	22.0	115		19.2	
MADISON RIVER near Grayling (3)	542	104	584	523	430	105	456	409	
MADISON RIVER near McAllister (4)	920	103	1024	892	732	104	797	706	
GALLATIN RIVER near Gateway	496	87	592	572	425	87	501	488	
INFLOW HIDDLE CREEK RESERVOIR near Bozeman (5)	23.6	78		30.3	20.4	78		26.2	
HYALITE CREEK near Bozeman (6)	37.9	80		47.4	33.0	80		41.0	
GALLATIN RIVER at Logan	505	78		669	435	78		557	
MISSOURI RIVER at Toston (7)	2385	89	3470	2,671	2090	90	3072	2,330	
SHEEP CREEK near White Sulphur Springs	14.5	64	24.5	12.5	63	63	21.0	19.8	
SUN RIVER at Gibson Dam (8)	352	61	596	580	318	60	544	529	
BELT CREEK near Monarch	89.0	61		146	80	60		134	
MISSOURI RIVER at Fort Benton (9)	3345	81		4,148	2940	81		3,640	
TWO MEDICINE CREEK near Browning (10)	180	69		259	172	70		244	
BADGER CREEK near Browning	90.0	68		133	78.0	67		116	
MARIAS RIVER near Shelby	370	64	521	577	340	64	494	532	
MISSOURI RIVER at Virgelle (11)	3990	83		4,793	3515	83		4,238	
NORTH FORK MUSSELSHELL RIVER near Delphine	4425	85		5,214	3900	85		4,586	
SOUTH FORK MUSSELSHELL RIVER above Martinsdale	3.6	56		6.4	3.0	55		5.5	
MISSOURI RIVER below Fort Peck Dam (11)	33.0	54		61.5	31.5	55		57.6	
MILK RIVER at Eastern Crossing	4125	84		4,929	3680	84		4,381	
MILK RIVER at Eastern Crossing (12)*	263	105		250					
INFLOW LAKE SAKAKAWA, ND (11)	81.0	98		83					
	11165	83		13,450	10160	83		12,239	
SASKATCHEWAN RIVER BASIN									
SWIFTCURRENT CREEK at Sherburne (13)	118	89	133	132	102	89	117	115	
ST. MARY'S RIVER near Babb (13)	445	89		498	378	89		426	

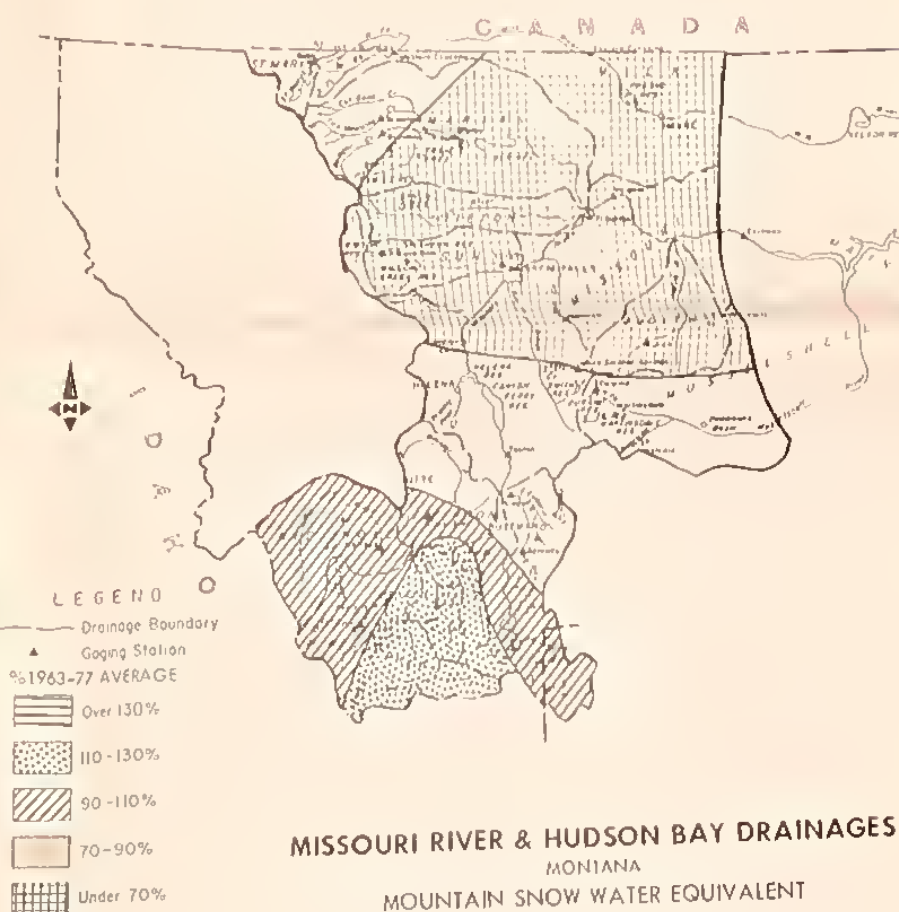
*March-September forecast

- (1) Adjusted for storage in Lima Reservoir.
- (2) Adjusted for storage in Lima and Clark Canyon Reservoirs.
- (3) Adjusted for storage in Hobgen Lake.
- (4) Adjusted for storage in Hobgen Lake and Ennis Lake.
- (5) Sun at West Fork Hyalite Creek and East Fork Hyalite Creek above the Reservoir.
- (6) Adjusted for storage in Middle Creek Reservoir.
- (7) Adjusted for storage in Lima, Hobgen, Ennis & Clark Canyon Reservoirs.
- (8) Adjusted for storage in Gibson Reservoir & diversions.
- (9) Adjusted for storage in Lima, Clark Canyon, Hobgen, Ennis, Gibson, Pliskun, Willow Creek & Cooney Ferry Reservoirs.
- (10) Adjusted for storage in Two Medicine Reservoir & diversions in Two Medicine Canal.
- (11) Adjusted for all upstream reservoirs.
- (12) Flow at Eastern Crossing minus St. Mary's Canal.
- (13) Adjusted for storage in Lake Sherburne.

ALL FORECASTS PREPARED IN COOPERATION WITH THE NATIONAL WEATHER SERVICE



Snowfall improved in some areas during March but snow depths are still below average in many drainages.



MISSOURI RIVER & HUDSON BAY DRAINAGES
MONTANA
MOUNTAIN SNOW WATER EQUIVALENT

Snowpack varies Southwest forecasts improve

Above average snowfall continues in the southwestern portion of the drainage and remains below average in the drainages of central Montana. After the April 1, 1983, snow surveys, the Easter weekend snowstorm dropped 1 to 2 inches of water equivalent in and around Bozeman. Other southwestern mountain areas received from one-half to one inch of moisture from this storm.

Headwaters of the Red Rock, Ruby and parts of the Madison River drainages have well above average snowpack. Snow in the remaining areas of the Missouri River headwaters is generally near average. Conditions deteriorate on downstream tributaries where the water stored in the snowpack is only one-half to two-thirds of average.

Conditions improve in the extreme northwest where the St. Mary's River headwaters in Glacier National Park have snowpack nearer to but still below average. Most low elevations showed some melt during March.

Forecasts of spring and summer runoff have been increased on most southwest streams. Above average runoff is expected from the Red Rock, Beaverhead and Ruby Rivers. Adjacent streams are predicted to have flows near to a little below average. Downstream tributaries are forecast to have below average runoff with some central Montana drainages expected to produce only one-half their normal runoff.

Irrigation water supply shortages will be common by late June in all areas of central Montana not having stored water.

Some late season irrigation water shortages may occur on the Gallatin and Big Hole Rivers but adequate irrigation water supplies should be available into mid-July.

WATER SUPPLY OUTLOOK

Expressed as "Poor, Fair, Average, Excellent" With Respect to Usual Supply

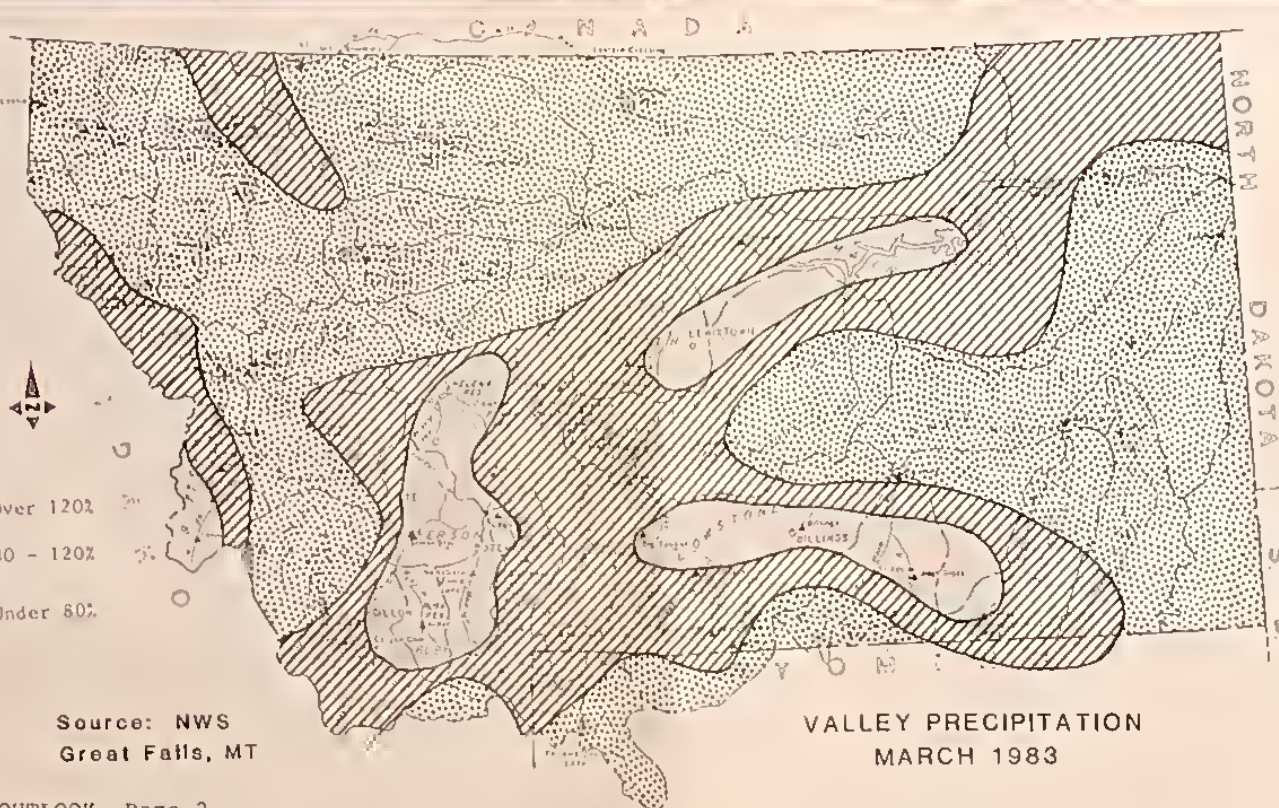
STREAMS or AREA	Spring Season	Late Season
Beaverhead	Exc	Avg
Ruby	Exc	Avg
Big Hole	Avg	Avg
Boulder	Fair	Poor
Jefferson	Avg	Fair
Madison	Avg	Avg
Gallatin	Avg	Fair
West-Side Missouri	Fair	Poor
Smith-Belt	Fair	Poor
Sun	Poor	Poor
Teton	Poor	Poor
Marias	Fair	Poor
Judith	Poor	Poor
Musselshell	Fair	Poor
Milk	Avg	Fair
Bear Paws	Fair	Fair
St. Mary's	Fair	Fair

SUMMARY OF SNOW MEASUREMENTS

RIVER BASIN and/or SUBWATERGAGE	Number of Gauging Stations	THIS YEAR'S SNOW WATER AS PERCENT OF 1963-77 AVERAGE
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Beaverhead	25	100	117
Ruby	12	103	114
Big Hole	22	80	96
Boulder	13	69	83
Jefferson	72	89	105
Madison	31	88	103
Gallatin	23	83	88
Missouri Headwater	126	87	101
West-side Missouri (Toston-Cascade)	9	65	75
Smith-Belt-Arrow	8	72	74
Missouri Main-stem	17	69	74
Teton & Sun	10	53	64
Marias	4	59	70
Marias-Teton-Sun	14	55	67
Judith-Musselshell	17	74	72
Milk	7	48	53
Bear Paws	6	28	25
Missouri (Total)	174	82	93

Saskatchewan			
St. Mary's	3	80	85
Bow River in Alberta	15	84	84



Source: NWS
Great Falls, MT

VALLEY PRECIPITATION
MARCH 1983

SNOW SURVEY DATA

SNOW April 1, 1983						
DRAINAGE BASIN and/or SNOW COURSE		THIS YEAR			PAST RECORD	
NAME	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	Average
ABUNDANCE LAKE	8800	3/31	66	20.8	25.5	22.5
AMBROSE	6480	3/27	33	11.1	17.0	14.4
ARCH FALLS	7350	3/29	42	10.8	14.2	14.4
ASHLEY DIVIDE	4820	3/30	13	4.4	8.2	-
ASHLEY LAKE	4000	3/30	13	4.3	6.7	-
BAODER PASS	6900	4/04	79	29.6	41.8	41.7
BAODER PASS PILLOW	6900	4/01	SP	26.1	41.8	-
BALD RIDGE	7500	3/30	38	10.0	13.3	14.6
BANFIELD MOUNTAIN	5600	3/28	59	24.0	28.4	25.8
BANFIELD MOUNTAIN PILLOW	5600	3/28	SP	20.6	26.9	22.5
BARRE CREEK	5500	4/01	116	45.5	54.5	50.3
BARRE MIDWAY	4600	3/31	95	37.6	39.6	38.8
BARRE TRAIL	3800	4/01	9	3.6	9.2	9.8
BARKER LAKES	8250	3/25	54	16.4	15.9	-
BARKER LAKES PILLOW	8250	4/01	SP	17.9	17.7	-
BASIN CREEK	7180	3/28	46	11.4	11.8	8.4
BASIN CREEK PILLOW	7180	4/01	SP	9.4	11.0	-
BASSOOD PEAK	5150	3/31	20	7.3	10.2	11.5
BEAGLE SPRINGS	8850	3/31	40	8.6	12.5	-
BEAGLE SPRINGS PILLOW	8850	4/01	SP	9.0	12.7	-
BEAR BASIN	8150	3/28	69	21.6	25.4	23.3
BEAR PAW SKI AREA	5200	3/31	8	2.3	8.4	7.3
BEAVER LAKE	5900	4/04	49	15.8	30.2	25.8
BERRY MEADOW	7300	4/04	30	8.0	10.6	8.4
OIG COULEE	5100	3/30	12	3.6	-	8.3
OIG CREEK	6750	4/04	126	49.3	51.6	47.6
OIG SKY	7700	4/01	57	15.6	21.2	17.3
OIG SKY MEADOW	6350	3/28	29	10.2	12.6	10.0
OTG SNOWY	7150	3/28	52	16.6	19.3	24.1
BLACK BEAR	7950	3/30	124	48.4	57.4	44.1
BLACK BEAR PILLOW	7950	3/30	SP	42.1	50.1	40.0
BLACK MOUNTAIN	7750	3/28	51	14.5	18.1	-
BLACK PINE	7100	3/30	36	10.6	18.6	15.5
BLACK PINE PILLOW	7100	3/30	SP	11.0	19.6	16.0
BLOODY DICK	7600	3/31	47	14.0	18.2	14.8
BLOODY DICK PILLOW	7600	3/31	SP	12.8	16.5	-
BLUE LAKE	5900	4/04	52	18.9	33.6	28.0
BOOTS SOTS	8000	3/29	36	8.3	6.8	9.1
BOULDER MOUNTAIN	7950	3/28	60	19.0	21.3	20.7
BOULDER MOUNTAIN PILLOW	7950	4/01	SP	22.8	25.3	-
BOX CANYON	6670	4/01	27	9.0	12.9	14.2
BOX CANYON PILLOW	6670	4/01	SP	7.1	12.7	-
BOXELDER CREEK	5100	3/31	0	.0	-	8.6
BRANHAM LAKES	8850	3/28	100	33.2	35.6	31.9
BRIDGER OWL	7800	3/31	64	22.5	28.2	30.2
BRIDGER BOWL PILLOW	7250	3/31	SP	22.1	26.4	29.5
BRISTOW CREEK	3900	3/28	13	5.7	13.0	12.6
BRUSH CREEK TIMBER	5000	4/01	29	8.8	11.0	10.6
HULL MOUNTAIN	6600	3/31	21	6.4	8.6	6.7
CABIN CREEK	5200	3/27	9	2.4	7.4	7.2
CALL ROAD	8050	3/30	50	14.6	13.1	13.1
CALVERT CREEK	6450	4/04	47	11.8	15.4	13.2
CALVERT CREEK PILLOW	6450	4/01	SP	8.9	12.4	9.8

SNOW April 1, 1983						
DRAINAGE BASIN and/or SNOW COURSE		THIS YEAR			PAST RECORD	
NAME	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	Average
CAMP MISERY	6400	3/29	118	49.4	50.3	52.0
CAMP SENIA	7890	3/29	31	7.4	3.2	7.7
CARROT BASIN	9000	3/28	109	37.1	50.6	39.5
CARROT BASIN PILLOW	9000	3/28	SP	31.3	33.3	29.8
CARTER CREEK	7400	3/30	27	7.8	6.9	6.6
CASHE CREEK PILLOW	7800	4/01	SP	10.0	12.4	-
CEDAR GROVE	4100	3/28	24	9.4	12.8	14.2
CHESSMAN RESERVOIR	6200	3/28	15	3.4	4.8	4.2
CHICKEN CREEK	4060	3/30	27	11.1	15.8	-
CLOVER MEADOW	8600	3/30	65	20.0	19.0	19.7
CLOVER MEADOW PILLOW	8600	4/01	SP	13.1	21.7	-
COLE CREEK	7850	3/28	74	20.6	16.0	19.6
COLE CREEK PILLOW	7850	3/28	SP	18.3	15.3	19.4
COLLEY CREEK	6300	3/29	19	5.8	10.6	9.8
COMBINATION	5600	3/30	14	4.8	8.8	6.5
COMBINATION PILLOW	5600	3/30	SP	4.5	9.4	6.6
COOKE STATION	8150	3/29	55	17.4	23.6	21.3
COPPER BOTTOM	5200	4/01	15	5.4	16.7	11.9
COPPER BOTTOM PILLOW	5200	4/01	SP	6.5	14.2	14.8
COPPER CAMP	6950	4/01	66	24.5	40.8	34.2
COPPER CAMP PILLOW	6950	4/01	SP	23.5	43.0	42.8
COPPER CREEK	5700	4/01	30	10.9	22.1	16.1
COPPER LAKE CREEK	6100	4/01	57	20.7	31.5	26.3
COPPER MOUNTAIN	7700	3/30	45	11.2	16.4	12.2
COTTONWOOD CREEK	6400	3/28	27	7.4	10.3	9.0
COYOTE HILL	4200	3/29	16	5.2	11.8	10.7
CREVICE MOUNTAIN	8400	3/30	37	9.0	14.9	11.5
CRYSTAL LAKE	6100	3/28	33	9.4	13.6	15.7
CRYSTAL LAKE PILLOW	6100	4/01	SP	10.2	12.3	-
DAD CREEK LAKE	8400	3/31	55	13.6	17.5	15.8
DAISY PEAK	7600	3/28	37	9.2	14.2	12.0
DAILY CREEK	5780	3/27	31	10.6	16.4	13.1
DAILY CREEK PILLOW	5780	4/01	SP	13.8	18.3	-
DARKHORSE LAKE	8600	3/31	74	24.6	31.6	30.1
DARKHORSE LAKE PILLOW	8600	4/01	SP	19.4	30.2	-
DAVIS CREEK	5400	3/28	64	26.8	30.2	27.1
DEADMAN CREEK	6450	3/31	30	9.4	11.8	12.6
DEADMAN CREEK PILLOW	6450	3/31	SP	6.2	12.0	11.1
DESERT MOUNTAIN	5600	3/28	40	12.2	17.4	17.3
DEVILS SLIDE	8100	3/29	70	21.8	25.3	24.6
DISCOVERY BASIN	7050	3/29	33	9.0	13.8	11.9
DIVIDE	7900	3/30	53	15.5	14.2	12.2
DIVIDE PILLOW	7900	3/30	SP	14.5	17.2	12.8
DIX HILL	6400	3/27	20	7.3	14.2	10.4
EAGLE CREEK	7000	3/29	36	11.4	15.6	16.1
EAST BOULDER S.	9250	3/30	81	26.5A	36.5	33.6
EAST FORK R.S.	5400	3/28	9	2.6	8.6	6.7
EL DORADO MINE	7800	3/28	66	19.8	26.0	23.8
EL DORADO SPRINGS	7800	3/29	36	9.0	11.5	10.1
ELK PEAK	8000	3/29	53	14.3	18.4	18.7
EMERY CREEK	4350	3/28	41	12.4	17.7	17.1
EMERY CREEK PILLOW	4350	3/28	SP	16.8	18.6	-
FATTY CREEK	5500	4/04	71	25.7	29.0	25.1
FISH CREEK	8000	3/28	52	14.5	14.4	9.8
FISHER CREEK	9100	3/29	88	31.9	44.8	41.3

SNOW April 1, 1983						
DRAINAGE BASIN and/or SNOW COURSE		THIS YEAR			PAST RECORD	
NAME	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	Average
FISHER CREEK PILLOW	9100	3/29	SP	28.5	41.8	38.7
FIVE-HULL	5700	4/01	11	3.9	9.7	7.6
FLATTOP MOUNTAIN PILLOW	6300	4/01	SP	45.6	47.8	51.6
FLEETCREE RIDGE	7500	3/31	42	12.1	14.6	12.2
FOOLHEN	8280	3/31	59	17.4	20.6	19.1
FOREST LAKE	6400	3/29	33	9.8	11.9	12.3
FOUR MILE	6900	3/31	35	10.9	9.8	9.3
FOURTH OF JULY	3450	4/01	13	4.8	7.3	-
FREIGHT CREEK	6000	4/04	32	10.1	21.5	17.2
FRIDAY HILL	4620	4/01	56	22.4	24.6	-
FROHNER MEADOWS	6480	3/28	24	6.8	11.2	9.2
FROHNER MEADOWS PILLOW	6480	3/28	SP	7.3	11.1	10.0
GARVER CREEK	4250	3/28	29	11.2	12.4	12.0
GARVER CREEK PILLOW	4250	3/28	SP	10.6	11.6	10.8
GIBBONS PASS	7100	3/28	66	24.8	30.9	24.8
GOAT MOUNTAIN	7000	3/28	22	6.3	13.7	11.6
GOLD CREEK LAKE	7200	3/28	51	14.4	19.4	17.7
GOLD STONE	8100	3/31	58	18.0	22.8	18.9
GRASSHOPPER	7000	3/29	21	5.8	6.7	6.4
GRAVE CREEK	4300	3/28	44	14.8	18.6	19.2
GRAVE CREEK PILLOW	4300	3/28	SP	16.6	17.9	18.7
GRIFFIN CREEK DIVIDE	5150	3/31	30	10.0	14.0	12.2
GRIZZLY PEAK	8640	3/28	69	19.1	14.1	17.9
GUNSIGHT LAKE	6300	4/04	87	32.2	47.9	42.7
HAND CREEK	5030	4/01	40	11.8	15.6	14.1
HAND CREEK PILLOW	5030	4/01	SP	8.1	18.8	-
HAWKINS LAKE	6450	3/28	79	32.1	36.0	34.2
HAWKINS LAKE PILLOW	6450	3/28	SP	28.1	31.7	31.6
HAYMAKER	8050	3/30	42	11.0	14.4	13.8
HEART LAKE TRAIL	4800	3/29	38	15.4	24.2	23.8
HEBGEN DAM	6550	3/29	46	15.5	16.4	12.5
HELL ROARING DIVIDE	5770	3/31	78	29.3	34.2	34.4
HERRIG JUNCTION	4850	3/30	70	25.3	33.2	-
HIGHWOOD DIVIDE	5650	3/30	22	7.0	-	10.6
HIGHWOOD STATION	4600	4/05	3	0.7	-	4.6
HOLBROOK	4530	4/01	15	4.8	11.3	10.7
HOOD MEADOW	6600	3/29	34	8.9	12.4	12.4
HOODWOOD BASIN	6000	3/29	109	46.2	65.0	53.6
HOODWOOD BASIN PILLOW	6000	4/01	SP	41.9	54.3	51.9
HOODWOOD CREEK	5900	3/29	100	41.4	58.5	49.9
INTERDEPENDENCE	7850	4/01	47	15.7	19.8	20.3
INTERGARD	6450	3/31	23	6.4	11.6	9.4
JACK CREEK	7500	3/31	26	7.8	8.6	6.5
JAHNKE LAKE TRAIL	7200	3/30	39	10.8	15.7	10.5
JOHNSON PARK	6450	3/28	18	4.8	10.0	7.1
KEELER CREEK	3300	3/28	17	6.6	13.3	11.5
KINGS HILL	7500	3/31	36	10.8	15.3	15.8
KISHENEH	3890	3/29	18	5.1	10.0	8.2
KIWANIS CAMP	3720	3/31	0	.0	.0	1.6
KRAFT CREEK PILLOW	4750	4/01	SP	9.8	17.1	-
LAKE CREEK	6100	3/30	33	10.5	9.5	10.3
LAKEVIEW CANYON	6930	3/31	61	20.2	13.2	13.8
LAKEVIEW RIDGE	7400	3/31	57	19.2	13.4	12.1
LAKEVIEW RIDGE PILLOW	7400	4/01	SP	22.0	13.9	-
LEMMI PASS	7480	3/29	27	7.8	10.4	9.9
LEMMI RIDGE	8100	3/31	37	9.3	12.8	10.9
LEMMI RIDGE PILLOW	8100	3/30	SP	9.1	14.1	11.0
LICK CREEK	6860	3/29	35	9.2	12.2	11.3

SNOW April 1, 1983		THIS YEAR			PAST RECORD	
DRAINAGE BASIN and/or SNOW COURSE		Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	
NAME	Elevation				Last Year	Average
LICK CREEK PILLOW	6860	3/29	SP	9.5	11.8	11.1
LITTLE PARK	7400	3/28	55	16.1	19.7	17.6
LOGAN CREEK	4300	4/01	18	5.2	9.1	7.7
LOME MOUNTAIN	8800	3/31	74	25.8	29.0	24.6
LOST HORSE	5940	4/01	77	28.8	45.2	35.2
LOST SOUL	4800	3/28	40	15.0	20.4	16.8
LOWER TWIN	7900	3/31	74	25.1	25.6	22.1
LOWER TWIN PILLOW	7900	4/01	SP	24.4	22.2	-
LUBRECHT FLUME	4800	4/04	0	0	8.5	6.5
LUBRECHT FLUME PILLOW	4800	4/01	SP	1.0	9.3	6.4
LUBRECHT FOREST # 3	5650	4/04	16	5.0	10.8	7.8
LUBRECHT FOREST # 4	4650	4/04	0	0	3.8	2.9
LUBRECHT FOREST # 6	4040	4/04	1	4	4.6	2.9
LUBRECHT HYDROPLOT	4200	4/04	0	0	7.8	3.7
MADISON PLATEAU	7750	3/30	79	27.3	29.1	23.9
MADISON PLATEAU PILLOW	7750	3/30	SP	26.9	30.4	24.8
MANY GLACIER	4960	3/30	48	18.5	24.5	-
MANY GLACIER PILLOW	4960	4/01	SP	15.6	22.8	-
MARIAS PASS	5250	4/02	45	16.4	25.4	19.2
MAYNARD CREEK	6210	3/31	41	12.7	14.5	14.9
MAYNARD CREEK PILLOW	6210	3/31	SP	10.4	10.0	12.6
MIDDLE MILL CREEK	7850	3/28	65	21.5	18.4	18.2
MILL CREEK	7500	3/29	36	9.0	15.4	14.8
MINERAL CREEK	4000	3/29	38	15.4	22.4	19.2
MONUMENT PEAK	8800	4/01	71	23.4	30.9	29.1
MONUMENT PEAK PILLOW	8800	4/01	SP	17.0	25.0	-
MOULTON RESERVOIR	6850	3/24	26	7.1	9.2	-
MOUNT LOCKHART	6400	3/30	57	18.4	28.0	23.9
MOUNT LOCKHART PILLOW	6400	3/30	SP	16.3	28.4	21.8
NUDD LAKE	7650	4/04	65	21.9	27.0	22.4
MULE CREEK	8300	3/31	52	14.5	20.0	-
MULE CREEK PILLOW	8350	4/01	SP	13.3	18.8	-
NEVADA CREEK	6480	4/01	38	12.8	19.2	-
NEVADA CREEK PILLOW	6480	4/01	SP	11.6	17.5	-
NEW WORLD	6700	3/30	47	14.0	16.0	17.3
NEWTON MOUNTAIN	5600	4/01	101	39.2	42.0	-
NEZ PERCE CAMP	1560	3/31	39	12.8	20.8	16.4
NEZ PERCE CAMP PILLOW	1560	3/31	SP	13.0	21.6	-
NEZ PERCE CREEK	6500	3/30	22	6.4	10.3	7.7
NEZ PERCE PASS	6570	3/31	42	13.7	24.1	19.0
NOISY BASIN	6040	3/29	117	47.3	44.1	48.3
NOISY BASIN PILLOW	6040	4/01	SP	43.7	41.3	41.2
NORTH FK. ELK CREEK	6250	4/04	39	11.4	18.8	13.9
NORTH FK. ELK CREEK PILLOW	6250	4/01	SP	11.1	21.0	14.4
NORTH FORK JOCKO	6330	4/01	103	39.7	54.3	48.4
NORTH MEADOW	7500	3/31	41	11.2	9.2	9.4
NORTHEAST ENTRANCE	7400	4/03	29	8.4	9.7	10.4
NORTHEAST ENTRANCE PILLOW	7400	4/01	SP	8.5	10.9	9.8
NOTCH	8500	3/30	71	22.6	18.4	17.5
OPHIR PARK	7150	3/27	45	15.6	21.4	21.1
PALISADE CREEK	8250	4/01	83	30.0	39.2	33.1
PETERSON MEADOWS	7200	3/31	35	9.3	13.2	11.5
PETERSON MEADOWS PILLOW	7200	3/31	SP	9.7	12.8	12.0
PICKET PIN 0	9450	3/30	67	22.0	30.0	28.5
PICKET PIN LOWER	6200	3/30	13	3.4	2.0	2.6

Columbia River Drainage

STREAMFLOW FORECASTS

BASIN & STREAM WITH FORECAST POINT	THIS YEAR				PAST RECORD				THIS YEAR				PAST RECORD			
	FORECAST	PERCENT OF AVERAGE	LAST YEAR	AVERAGE	FORECAST	PERCENT OF AVERAGE	LAST YEAR	AVERAGE	FORECAST	PERCENT OF AVERAGE	LAST YEAR	AVERAGE	FORECAST	PERCENT OF AVERAGE	LAST YEAR	AVERAGE
PERIOD	April - September				April - July				April - June							
KOOTENAI RIVER below Libby Dam (1)	6,670	92	7,017	7,246	5,690	92	5,878	6,178								
FISHER RIVER near Libby	204	76		270	190	75		253								
YAK RIVER near Troy	480	89		537	455	88		514								
KOOTENAI RIVER at Leonia (1)	8,060	91	8,643	8,883	7,010	91	7,413	7,727	5600	91	5,921	6,150				
INFLOW MOULTON RESERVOIR nr BUTTE (Million Gallons)					212	74	360	286			328	260				
WARM SPRINGS CREEK AT MEYERS DAM near Anaconda (2)	42.3	83		50.7	34.5	84		41.2								
FLINT CREEK near Southern Cross (3)	13.5	73	24.6	18.5	11.2	73	20.0	15.4								
FLINT CREEK below Boulder Creek (4)	57.0	73		77.6	45.0	73		61.3								
INFLOW LOWER WILLOW CREEK RESERVOIR near Hall (5)	11.2	66	15.9	16.9	10.6	66	15.1	16.0								
MIDDLE FORK ROCK CREEK near Phillipsburg	66.6	84		78.8	60.0	84		71.1								
NEVADA CREEK near Fium	16.0	68		23.6	14.7	67		21.8								
BLACKFOOT RIVER near Ronner	750	74		1,017	670	73		920	580	73		794				
CLARK FORK RIVER above Hilltown (6)	680	81		843	590	81		730	495	81		613				
CLARK FORK RIVER above Missoula	1,430	77	2,260	1,859	1,260	76	2,038	1,651	1,075	76	1,645	1,408				
WEST FORK BITTERROOT RIVER near Conner (7)	1,137	73		187	125	73		172								
BITTERROOT RIVER near Darby	425	71		602	390	71		552	345	72		480				
SKALKAMU CREEK near Hamilton	45.8	80		57.4	39.5	79		49.8								
BURNT FORK CREEK near Stevensville (8)	32.0	82		38.8	27.7	82		33.6								
BITTERROOT RIVER at Missoula (9)	1,100	71		1,543	1,010	71		1,416	870	72		1,211				
CLARK FORK RIVER below Missoula	2,530	74		3,405	2,270	74		3,069	1,945	74		2,618				
CLARK FORK RIVER at St. Regis	3,290	73	5,715	4,521	2,950	72	5,292	4,078	2,510	72	4,309	3,492				
NORTH FORK FLATHEAD RIVER near Columbia Falls	1,700	86		1,969	1,530	86		1,782	1,300	87		1,498				
MIDDLE FORK FLATHEAD RIVER near West Glacier	1,510	79	2,083	1,911	1,390	79	1,925	1,750	1,180	80	1,544	1,470				
SOUTH FORK FLATHEAD RIVER near Columbia Falls (10)	1,780	77	2,559	2,302	1,660	77	2,428	2,159	1,460	77	2,034	1,884				
FLATHEAD RIVER at Columbia Falls (10)	1,510	81	6,549	6,330	4,710	81	6,080	5,827	4,050	82	4,990	4,964				
SWAN RIVER near Big Fork	574	84		681	503	84		596								
FLATHEAD RIVER near Polson (11)	6,020	81	8,005	7,394	5,510	81	7,323	6,806	4,700	81	5,910	5,779				
CLARK FORK RIVER near Plains (11)	9,510	77	14,103	12,340	8,650	77	12,939	11,222	7,320	77	10,447	9,507				
THOMPSON RIVER near Thompson Falls	232	88		263	208	89		234								
PROSPECT CREEK at Thompson Falls	121	85		143	112	84		133								
CLARK FORK RIVER at Whitehorse Rapids (12)	10,700	78		13,781	9,720	78		12,519	8,300	78		10,633				

- (1) Adjusted for storage in Lake Koocanuco.
- (2) Adjusted for storage in Silver Lake, diversions to and pumping from Georgetown Lake.
- (3) Adjusted for storage in Georgetown Lake, diversions from and pumping to Silver Lake.
- (4) Sum Flint Creek at Maxville and Boulder Creek at Hallville.
- (5) Sum of North Fork Lower Willow Creek near Hall and South Fork Lower Willow Creek near Hall.
- (6) Difference in observed flow Clark Fork above Missoula and Blackfoot near Bonner.

- (7) Adjusted for storage in Painted Rocks Reservoir.
- (8) Adjusted for diversion into Sunset Highway Canal.
- (9) Difference in observed flow Clark Fork above and below Missoula.
- (10) Adjusted for storage in Hungry Horse Reservoir.
- (11) Adjusted for storage in Hungry Horse Reservoir and Flathead Lake.
- (12) Adjusted for storage in Hungry Horse Reservoir, Flathead Lake and Noxon Rapids Reservoir.

ALL FORECASTS PREPARED IN COOPERATION WITH THE NATIONAL WEATHER SERVICE

Runoff forecasts below average

Forecasts for spring and summer streamflow have been lowered in most drainages. Most watersheds in the Clark Fork drainage are expected to produce 20 to 30 percent less than average runoff. Streams in the Flathead River basin are also forecast at 75 to 85 percent of average. The Kootenai River is predicted to have a little higher runoff.

Irrigation water shortages will begin developing by mid to late June on smaller streams in the upper Clark Fork basin and by late June to early July on larger streams and rivers.

Irrigators not having stored water need to be prepared for the anticipated low flows.

Snowpack levels remain low

All areas show below average amounts of water stored in the mountain snowpack. Most of the drainages have 75-85 percent of their average water equivalent. Exceptions are the Kootenai River drainage, parts of the Swan and Mission Mountains, and a small area south of Butte which are all within 10 percent of average.

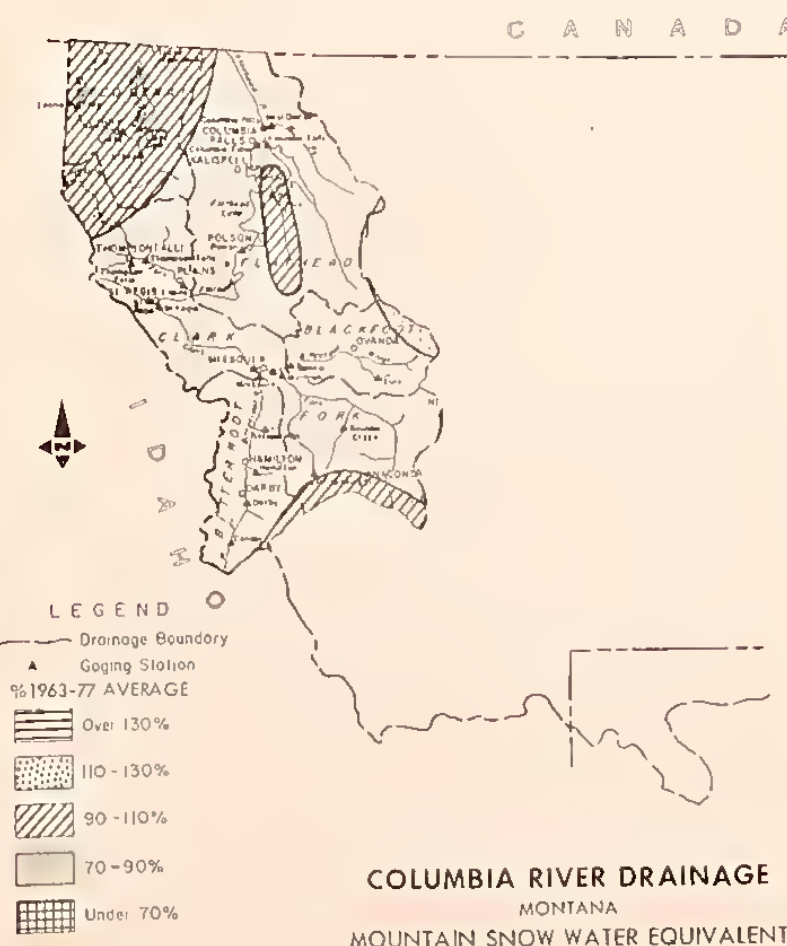
The lowest snowpack levels are in the upper Blackfoot River drainage and in the Phillipsburg-Drummond areas. Some snowmelt has occurred at most low elevations during March.

WATER SUPPLY OUTLOOK

STREAM or AREA	Spring Season	Summer Season
Tobacco	Fair	Fair
Little Bitterroot	Fair	Fair
Mission Valley	Avg	Fair
Flint Creek	Fair	Poor
Upper Clark Fork	Fair	Fair
Nevada Creek	Poor	Poor
Blackfoot	Poor	Poor
West-side Bitterroot	Fair	Poor
East-side Bitterroot	Fair	Poor
Bitterroot River	Fair	Poor
Lower Clark Fork	Fair	Fair

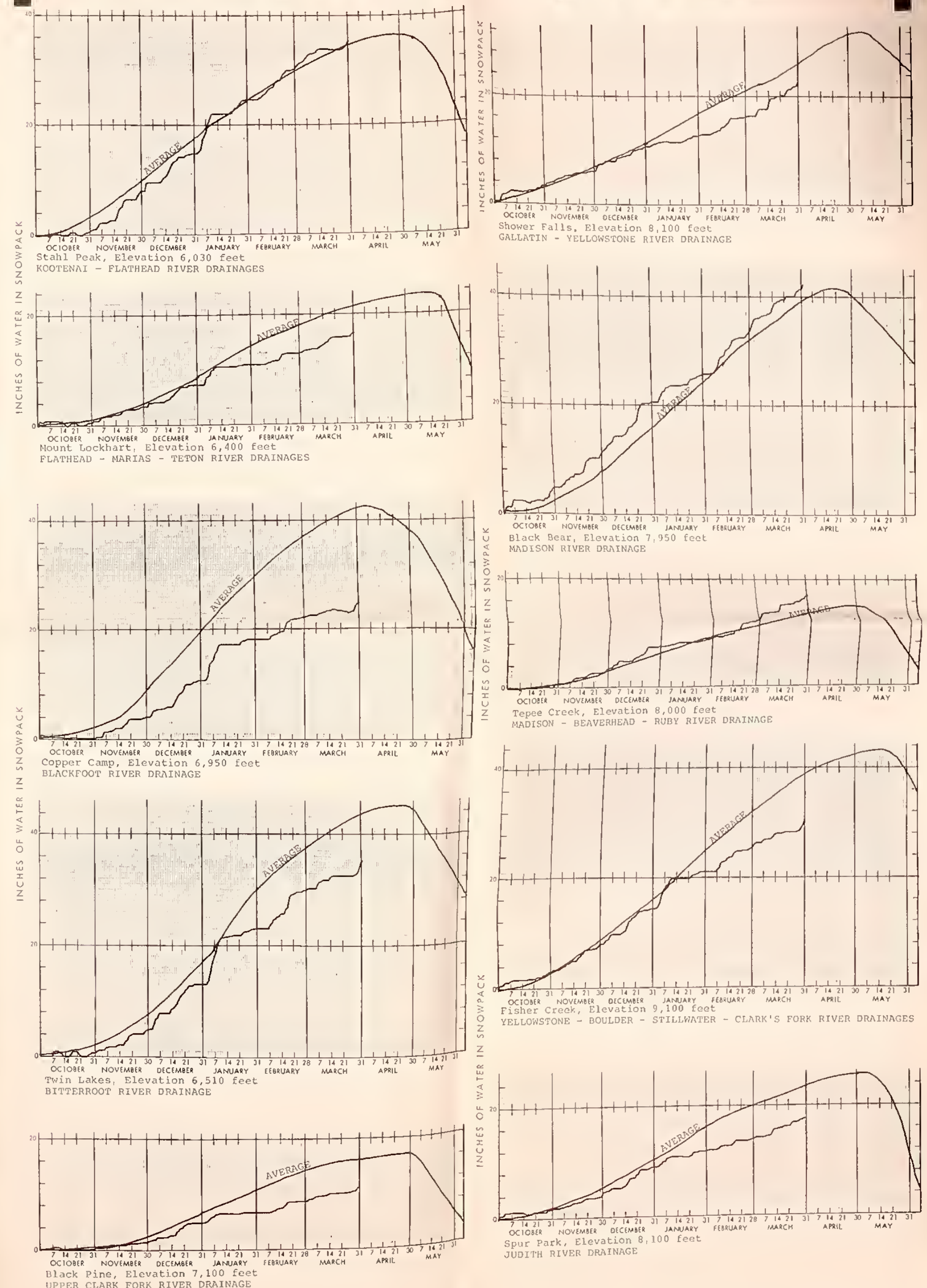


Shallow snowpacks are common in most mountainous areas this season.



COLUMBIA RIVER DRAINAGE
MONTANA
MOUNTAIN SNOW WATER EQUIVALENT

SNOW PILLOW DATA



RESERVOIR STORAGE (Thousand Acre Feet) END OF MONTH March 31, 1983

Basin or Stream	RESERVOIR	Usable Capacity	Usable Storage		
			This Year	Last Year	Average
COLUMBIA					
Kootenai	Kootenai	5,748.2	1,956.0	1,904.0	---
Flathead	Hungry Horse	3,451.0	2,699.0	2,158.0	2,016.0
	Flathead Lake	1,791.0	743.2	750.4	775.7
	Camas (4)	45.2	34.4	27.0	23.8
	Mission Valley (8)	100.3	46.7	24.4	41.1
	Georgetown Lake	31.0	24.1	28.5	24.0
Clark Fork	Lower Willow Creek	4.9	2.3	---	1.9
	Nevada Creek	12.6	8.9	8.9	7.9
	Noxon Rapids	334.6	322.2	312.1	191.9
	Painted Rocks	31.7	---	---	17.6
Bitterroot	Como	34.9	---	---	15.6
	MISSOURI				
Beaverhead	Lima	84.0	46.3	29.0	42.6
	Clark Canyon	257.2	179.9	167.3	143.7
Ruby	Ruby	38.8	31.9	---	30.9
Madison	Hebgen Lake	377.5	258.4	260.8	245.5
	Eunis Lake	41.0	17.7	30.1	34.4
Gallatin	Middle Creek	8.0	3.8	3.8	4.0
Missouri	Canyon Ferry	2,043.0	1,626.0	1,436.0	1,527.0
	Hauser & Helena	61.9	62.5	63.0	59.8
	Lake Helena	10.4	10.7	10.9	9.8
	Holter Lake	81.9	75.4	77.2	66.2
	Fort Peck Lake	18,910.0	15,700.0	14,200.0	15,480.0
	Smith River	10.6	9.5	8.1	7.7
	Newlan Creek	12.4	8.8	10.2	---
Husselshell	Bair	7.0	6.2	4.6	5.4
	Martinsdale	23.1	18.8	11.8	10.1
	Deadman's Basin	72.2	67.7	---	52.6
Sun	Gibson	99.1	67.0	56.2	47.0
	Willow Creek	32.2	24.7	24.7	22.8
	Pishkun	32.0	19.7	19.8	16.5
Marias	Lower Two Medicine	11.9	---	---	6.9
	Four Horns	19.2	---	---	12.3
	Swift	30.0	16.8	12.0	16.9
	Lake Frances	111.9	85.3	78.4	71.9
	Elwell (Tiber)	1,347.0	704.3	535.2	551.9
Milk	Beaver Creek	3.5	3.1	2.5	1.9
	Fresno	127.2	34.9	54.9	89.1
	Nelson	66.8	45.6	35.6	41.5
HUDSON BAY					
St. Mary's	Lake Sherburne	64.3	20.5	20.8	25.1
YELLOWSTONE					
Stillwater	Mystic Lake	21.0	1.5	0.6	4.3
Clark's Fork	Cooney	27.4	21.2	3.1	16.4
Tongue	Tongue River	68.0	13.4	18.4	44.0
Bighorn	Bighorn Lake	1,356.0	918.2	836.0	552.1

SATELLITE SNOW COVER

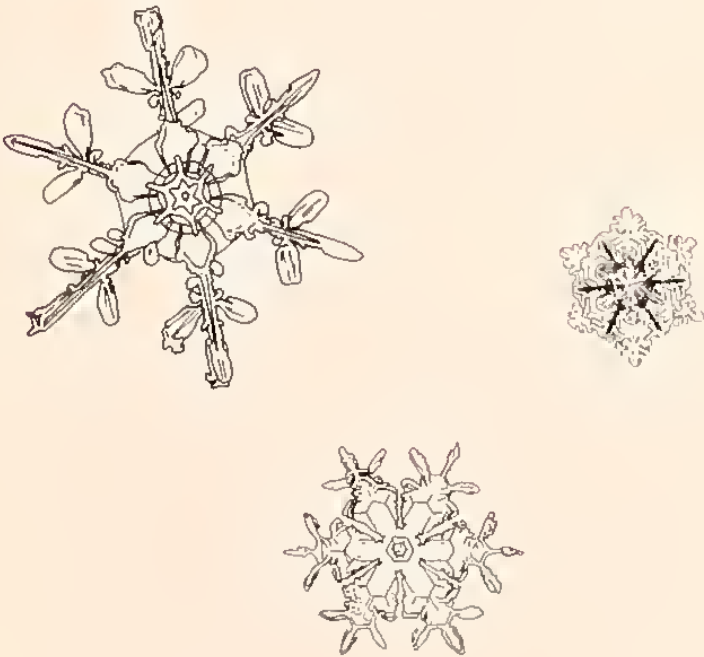


MISSOURI RIVER BASIN
Above
Canyon Ferry Dam

DATE	PERCENT SNOW COVER	AVERAGE SNOWLINE ELEVATION IN FEET
November 14, 1982	81	5290
November 1982	96	4300
November 24, 1982	95	4380
December 24, 1982	100	3800
January 18, 1983	76	5540
January 25, 1983	71	5770
February 3, 1983	76	5540
February 24, 1983	72	5720
March 10, 1983	65	6040
March 21, 1983	71	5770
March 26, 1983	72	5720



The winter snows are melting at many lower mountain sites.



AGENCIES AND ORGANIZATIONS COOPERATING IN MONTANA SNOW SURVEYS

GOVERNMENT AGENCIES

Canada

Department of the Environment
Atmospheric Environment Service
Water Management Service
British Columbia Ministry of Environment
Inventory and Engineering Branch, Hydrology Section
Alberta Environment
Technical Services Division

Federal

Department of the Army - Corps of Engineers
Department of Agriculture - Forest Service
- Soil Conservation Service
Department of Commerce - National Environmental Satellite Service
- National Weather Service
Department of Interior - Bureau of Indian Affairs
- Fish and Wildlife Service
- Geological Survey
- National Park Service
- Bureau of Reclamation
Department of Energy - Bonneville Power Administration

STATE AGENCIES

Montana Conservation Districts
Montana Department of Fish, Wildlife and Parks
Montana Department of Natural Resources and Conservation
Montana State University - Agricultural Experiment Station
University of Montana - School of Forestry

PRIVATE ORGANIZATIONS

The Anaconda Company
Big Sky of Montana
Butte Water Company
Flathead Valley Community College
Montana Power Company

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.